

Different behavior of PCLs after their update

Róbert Kolcún, rkolcun@redhat.com

1 Introduction

Only CrackLib, Pwscore & Zxcvbn-Python changed their behavior. 'C' implementation of Zxcvbn password checking library was added to this report. Other libraries as PassWDQC and Passfault have same results as in previous report <https://github.com/redhat-qe-security/pcl-analyzer/blob/master/outputs/pdf/comparison-password-checking.pdf>.

2 RockYou

2.1 Summary

CrackLib accepted	CrackLib rejected	Top reasons of rejection
475095 (41.82%)	661048 (58.18%)	OK - 41.82% it is based on a dictionary word - 29.54% it is too simplistic/systematic - 11.87% it does not contain enough DIFFERENT characters - 10.92%

Table 1: CrackLib - BEFORE

CrackLib accepted	CrackLib rejected	Top reasons of rejection
256753 (22.6%)	879390 (77.4%)	it is based on a dictionary word - 48.81% OK - 22.6% it is too simplistic/systematic - 11.87% it does not contain enough DIFFERENT characters - 10.92%

Table 2: CrackLib - NOW

Pwscore accepted	Pwscore rejection	Top reasons of rejection
93196 (8.2%)	1042947 (91.8%)	The password is shorter than 8 characters - 52.99% Low password score - 22.44% The password fails the dictionary check - it is based on a dictionary word - 12.72% OK - 8.2%

Table 3: Pwscore - BEFORE

Pwscore accepted	Pwscore rejection	Top reasons of rejection
57332 (5.05%)	1078811 (94.95%)	The password is shorter than 8 characters - 52.99% The password fails the dictionary check - it is based on a dictionary word - 25.29% Low password score - 12.97% OK - 5.05%

Table 4: Pwscore - NOW

Zxcvbn accepted	Zxcvbn rejection	Top reasons of rejection
75752 (6.67%)	1060391 (93.33%)	Add another word or two. Uncommon words are better. - 34.92% Common names and surnames are easy to guess. Add another word or two... ... Uncommon words are better. - 17.8% Dates are often easy to guess. Add another word or two. Uncommon words are better... ... Avoid dates and years that are associated with you. - 13.11%

Table 5: ZxcvbnPython - BEFORE

Zxcvbn accepted	Zxcvbn rejection	Top reasons of rejection
69630 (6.13%)	1066513 (93.87%)	Add another word or two. Uncommon words are better. - 30.92% Common names and surnames are easy to guess. - 19.59% This is similar to a commonly used password. - 14.39% Dates are often easy to guess. Add another word or two. Uncommon words are better... ... Avoid dates and years that are associated with you. - 13.11%

Table 6: ZxcvbnPython - NOW

ZxcvbnC accepted	ZxcvbnC rejection	Top reasons of rejection
75807 (6.67%)	1060336 (93.33%)	Low password score - 93.33% OK - 6.67%

Table 7: ZxcvbnC

2.2 Top accepted passwords

Number of uses	Password	Password score by library
49952	iloveyou	-
15163	babygirl	-
13134	iloveu	-
1552	zxcvbn	-
1205	1q2w3e4r	-
1031	password123	-

Table 8: CrackLib - BEFORE

Number of uses	Password	Password score by library
908	rock you	-
630	borboleta	-
588	emopunk	-
541	i love you	-
172	michaeljackson	-

Table 9: CrackLib - NOW

Number of uses	Password	Password score by library
3885	helloworld	40.0
2871	qwertyuiop	46.0
2868	harrypotter	50.0
1031	password123	65.0
700	qwerty123	40.0
355	1q2w3e4r5t	46.0

Table 10: Pwscore - BEFORE

Number of uses	Password	Password score by library
541	i love you	50.0
447	cheerleading	53.0
172	michaeljackson	81.0
66	hello kitty	59.0
41	thenotebook	46.0
39	qwertyuiopasdfghjklzxcvbnm	100.0

Table 11: Pwscore - NOW

Number of uses	Password	Password score by library
1508	jesucristo	3.0
1292	diosesamor	3.0
1112	teamomucho	3.0
1047	sagitario	3.0
129	ilovemydog	3.0

Table 12: ZxcvbnPython - BEFORE

Number of uses	Password	Password score by library
1021	tequieromucho	3.0
745	triskelion	3.0
690	winniethepooh	3.0
417	hotmail.com	4.0
412	yahoo.com	3.0

Table 13: ZxcvbnPython - NOW

Number of uses	Password	Password score by library
1507	tekiero	28.0
1161	gwapako	30.0
745	triskelion	31.0
417	hotmail.com	37.0
412	yahoo.com	29.0

Table 14: ZxcvbnC

2.3 One accepted, others rejected

Number of uses	Password	Password score by library
49952	iloveyou	-
15163	babygirl	-
13134	iloveu	-
9610	fuckyou	-
7766	tinkerbell	-

Table 15: Cracklib - BEFORE, Number of passwords: 343257

Number of uses	Password	Password score by library
908	iloveyou	-
630	babygirl	-
588	iloveu	-
241	fuck you	-
198	love you	-

Table 16: Cracklib - NOW, Number of passwords: 155535

No passwords for Pwscore - BEFORE library.
 No passwords for Pwscore - NOW library.

Number of uses	Password	Password score by library
745	triskelion	3.0
604	margarida	3.0
306	143445254	3.0
220	kamikazee	3.0
205	lollypop1	3.0

Table 17: ZxcvbnPython - BEFORE, Number of passwords: 5236

Number of uses	Password	Password score by library
1021	tequieromucho	3.0
690	winniethepooh	3.0
529	mumanddad	3.0
418	ilovemymom	3.0
85	rockyou.com	3.0

Table 18: ZxcvbnPython - NOW, Number of passwords: 10420

2.4 Accepted by all libraries

Number of uses	Password
91	<div><embed src=
85	Lets you update your FunNotes and more!
65	TEXT ONLY AD
37	l33tsupah4x0r
28	iydgTvmujl6f
26	ojkiyd0y'

Table 19: BEFORE - Number of password: 1794

Number of uses	Password
91	<div><embed src=
85	Lets you update your FunNotes and more!
65	TEXT ONLY AD
25	my chemical romance
23	fall out boy
21	to en mis cosas

Table 20: NOW - Number of password: 1199

3 Secure passwords

3.1 Summary

CrackLib accepted	CrackLib rejected	Reasons of rejection
355992 (99.78%)	799 (0.22%)	OK - 99.78% it is too simplistic/systematic - 0.14% it does not contain enough DIFFERENT characters - 0.08%

Table 21: CrackLib - BEFORE

CrackLib accepted	CrackLib rejected	Reasons of rejection
355928 (99.76%)	863 (0.24%)	OK - 99.76% it is too simplistic/systematic - 0.14% it does not contain enough DIFFERENT characters - 0.08%

Table 22: CrackLib - NOW

No data for Pwscore - BEFORE library.

No data for Pwscore - NOW library.

Zxcvbn accepted	Zxcvbn rejected	Reasons of rejection
339804 (95.24%)	16987 (4.76%)	OK - 95.24% Add another word or two. Uncommon words are better. - 4.44% Dates are often easy to guess. Add another word or two... ... Uncommon words are better. Avoid dates and years that are associated with you. - 0.2%

Table 23: ZxcvbnPython - BEFORE

Zxcvbn accepted	Zxcvbn rejected	Reasons of rejection
340110 (95.32%)	16681 (4.68%)	OK - 95.32% Add another word or two. Uncommon words are better. - 4.23% Dates are often easy to guess. Add another word or two... ... Uncommon words are better. Avoid dates and years that are associated with you. - 0.3%

Table 24: ZxcvbnPython - NOW

Zxcvbn accepted	Zxcvbn rejected	Reasons of rejection
351480 (98.51%)	5311 (1.49%)	OK - 98.51% Low password score - 1.49%

Table 25: ZxcvbnC

3.2 Rejected passwords

The next table shows some examples of passwords that are rejected. Whole output for every password checking library is in folder *LibrariesSummaryTransformedPass*.

Password checking library	Number of passwords	Rejected password
Cracklib	799	000062q hi^L54 FH@ { {z01
Pwscore	0	-
ZxcvbnPython	16987	E![[j88B A ?7r26X T#()h58v

Table 26: Example of rejected passwords - BEFORE

Password checking library	Number of passwords	Rejected password
Cracklib	863	R000065 -----02e 87A { {mM
Pwscore	0	-
ZxcvbnPython	16681	AI - z51 41y448Eo Oc() S28
ZxcvbnC	5311	69Sitñ0 2!7'@SY VRá >1) /-\[/\3/\7'j60 941385O

Table 27: Example of rejected passwords - NOW